Higher Computing Coursework Task 2007–2008

Geoffrey Sneddon

March 7, 2008

Part I

Programming

1

Algorithm With Data Flow

	Steps	Data Flow
1	Loop for all members.	
2	Enter valid height and weight.	(in: index, in/out: members(,))
3	Calculate and store BMI.	(in: index, in/out: members(,))
4	End loop.	
5	Calculate the number of members in each BMI category.	(in: members(,); out: under, ideal, over)
6	Display height, weight, and BMI of all members and the number of members in each BMI category.	(in: members(,), under, ideal, over)

The first dimension of the members array consists of each and every member in the array, whereas the second dimension consists of the height, weight, and BMI in that order for that member (i.e., a five by three array).

2

Refinements

2.1 Step 2

	Steps	Data Flow
1	Prompt for the user to enter the height.	(in: index, in/out: members(,))
2	Get valid height (i.e., 1.2m to 2.6m).	
3	Prompt for the user to enter the weight.	
4	Get valid weight (i.e., 30kg to 150kg).	

2.1.1 Step 2.2 and Step 2.4

	Steps	Data Flow
1	Get input.	(in: min, max; out: input)
2	While input < min or input > max:	
3	Notify the user the given input is invalid, ask to re-enter.	
4	Get new input.	
5	End while.	

2.2 Step 5

	Steps	Data Flow
1	Loop for all members:	(in: members(,); out: under, ideal, over)
2	If member BMI < 18.5:	
3	under++	
4	Else if member BMI is < 25:	
5	ideal++	
6	Else:	
7	over++	
8	End if.	
9	End loop.	

2.3 Step 6

	Steps	Data Flow
1	Clear display.	(in: members(,); out: under, ideal, over)
2	Print headers for per-member listing	
3	Loop for all members:	
4	Output height, weight, and BMI to one decimal place.	
5	End loop.	
6	Print headers for weight analysis.	
6	Print number of underweight members.	
6	Print number of ideal-weight members.	
6	Print number of overweight members.	

3

Listing Of Implementation

```
! Implementation of Higher Computing Coursework Task 2007-2008 Part 1
! Geoffrey Sneddon
! 2008-02-24/25
DECLARE DEF calculate_bmi
DIM members(5, 3)
FOR member = 1 to 5
    ! Height/weight
    CALL get_height_weight(members(,), member)
    ! BMI
    LET members(member, 3) = calculate_bmi(members(member, 1), members(member, 2))
NEXT member
CALL number_of_members_in_category(members(,), under, ideal, over)
CALL display_all(members(,), (under), (ideal), (over))
END

DEF get_value(min, max)
    ! Get a numeric input betweeen min and max inclusive.
    INPUT num
    DO while num < min OR num > max
       PRINT "The input must be between";min;"and";max;"inclusive."
       INPUT num
    LOOP
    LET get_value = num
END DEF

```

```
26 DEF calculate_bmi(height, weight)
27     ! Calculate the BMI of someone with the given height and weight
28     ! $BMI = \frac{weight}{height^2}$
29     LET calculate_bmi = weight/(height^2)
30 END DEF
31 
32 SUB get_height_weight(members(,), member)
33     ! Get the height and weight of a member
34     DECLARE DEF get_value
35     ! Height
36     PRINT "Please insert the height (in meters) of member";member
37     LET members(member, 1) = get_value(1.2, 2.6)
38     ! Weight
39     PRINT "Please insert the weight (in kilograms) of member";member
40     LET members(member, 2) = get_value(30, 150)
41 END SUB
42 
43 SUB number_of_members_in_category(members(,), under, ideal, over)
44     ! Count the number of members in each BMI category
45     FOR member = 1 to 5
46         LET BMI = members(member, 3)
47         IF members(member, 3) < 18.5 THEN
48            LET under = under + 1
49         ELSEIF members(member, 3) < 25 THEN
50            LET ideal = ideal + 1
51         ELSE
52            LET over = over + 1
53         END IF
54     NEXT member
55 END SUB
56 
57 SUB display_all(members(,), under, ideal, over)
58     ! Clear display
59     CLEAR
60 
61     ! Per-member listing (always to one decimal place)
62     PRINT "Height in meters";TAB(25);"Weight in kilograms";TAB(50);"
          BMI"
63     FOR member = 1 to 5
64         PRINT USING "##.#": members(member, 1);
65         PRINT TAB(25);
```

```
66          PRINT USING "##.#": members(member, 2);
67          PRINT TAB(50);
68          PRINT USING "##.#": members(member, 3)
69      NEXT member
70      PRINT
71      PRINT
72
73      ! Weight analysis
74      PRINT "Club Members Weight Analysis"
75      PRINT
76      PRINT "Category";TAB(30);"Number of members"
77      PRINT "Underweight";TAB(30);under
78      PRINT "Ideal weight";TAB(30);ideal
79      PRINT "Overweight";TAB(30);over
80  END SUB
```

4

Test Output

Height in meters	Weight in kilograms	BMI
1.6	62.3	24.3
1.7	73.3	25.4
1.3	44.0	26.0
1.4	58.1	29.6
1.6	47.2	18.4

Club Members Weight Analysis

Category	Number of members
Underweight	1
Ideal weight	1
Overweight	3

5

Evaluation

The testing that has been carried out (both with the given test data and other test data) leads me to be satisfied that the program is robust. It has proven its ability to cope with implausible inputs (by limiting the range that the height and weight can be in), which also makes it impossible to cause a divison by zero error by setting the height equal to zero.

The efficiency of the program could be improved by reducing the number of iterations over the members array by keeping a count of the number of underweight/ideal-weight/overweight members just after calculating the BMI of each member (i.e., just after step 3 of the top level algorithm). This would remove the need for a seperate iteration in step 5 (and would, in fact, totally remove any need for any logic out of the main loop). Any further reduction in the number of iterations would lead to a mix of logic and output, which is undesirable as it would reduce the maintainability of the code base.

Part II

Product Specification

1

Graphics Card

I looked at two different graphics cards: an MSI one based on the ATI Radeon HD 2600XT, and a Gigabyte one based on the Nvidia GeForce 8600GT.

1.1 Possibilities

1.1.1 MSI ATI Radeon HD 2600XT

Processor

It uses a 800MHz ATI RV630 — by far fast enough for any sort of graphics /video output, as it will be used for.

Memory

It has 512MB of memory, running at an effective clockspeed of 1100MHz. The speed of the memory won't be a bottle-neck for output (as the graphics card could easily decode the graphics/videos quicker than real-time).

Cost

It costs £68.86 — a reasonable price for a modern graphics card.

1.1.2 Gigabyte Nvidia GeForce 8600GT

Processor

It uses a 540MHz Nvidia G84 — again, by far quick enough for its intended use.

Memory

It has 512MB of memory, running at an effective clockspeed of 1400MHz. Again, by far quick enough to do what is needed of it.

Cost

It costs £72.21 — a similarly reasonable price.

1.2 Recommendations

I would recommend purchasing the *MSI ATI Radeon HD 2600XT* because:

1.2.1 Processor

Both have processors that are by far sufficant for the club's use of decoding high quality graphics and video data.

1.2.2 Memory

Again, both are by far sufficant for the club's use, though I expect the specified 512MB to be overkill for the use.

1.2.3 Price

The MSI ATI Radeon HD 2600XT has a slight advantage here — this is the only relevant difference between the two.

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Description

MSI Vivid is an easy tool to enhance image quality. It can helps users to get better image quality in viewing Digital photos, document & games. Vivid brings the easiest way to optimize graphic quality. Colorize your vision when browsing digital photos. Sharpen characters edge. Enhance contrast when playing game.

On-board Memory

800MHz Core Memory : 512MB DDR3 @ 1400MHz

On-board Function

TV_Out / Dual DVI-I Connectors Dual-Link DVI Support HDTV Support HDMI / HDCP Support Heat-Pipe Cooling Solution

Specifications

Video Memory	
Installed Size	512 MB
Memory Clock Speed	1400 MHz
Technology	DDR II SDRAM
Video Output	
Core Clock Speed	800 MHz
Digital Video Standard	Dual DVI
Graphics Processor / Vendor	ATI Radeon HD 2600XT
Interface Type	PCI Express

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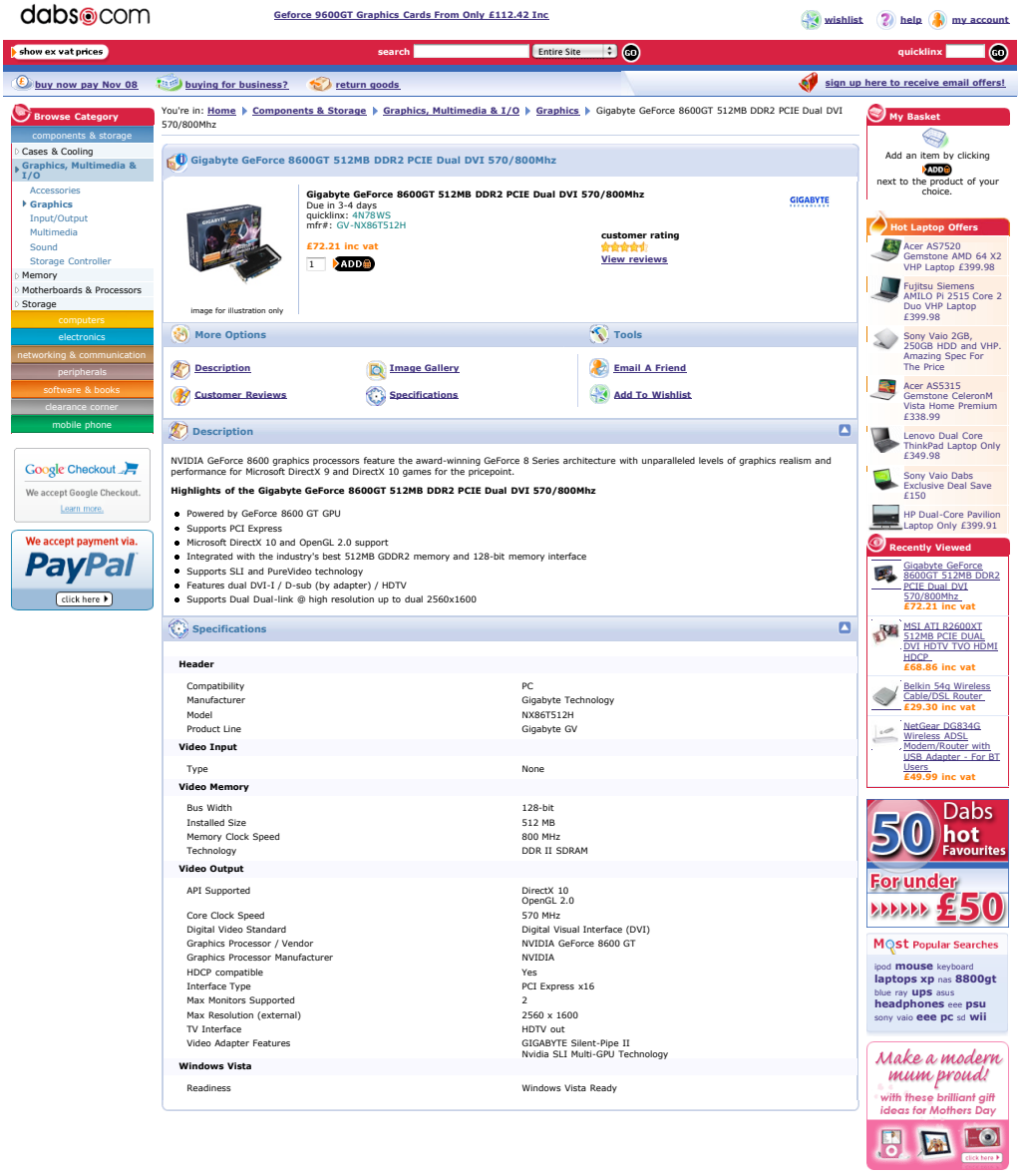
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NVIDIA GeForce 8600 graphics processors feature the award-winning GeForce 8 Series architecture with unparalleled levels of graphics realism and performance for Microsoft DirectX 9 and DirectX 10 games for the pricepoint.
Highlights of the Gigabyte GeForce 8600GT 512MB DDR2 PCIE Dual DVI 570/800Mhz
Powered by GeForce 8600 GT GPU
Supports PCI Express
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Integrated with the industry's best 512MB GDDR2 memory and 128-bit memory interface
Supports SLI and PureVideo technology
Features dual DVI-I / D-sub (by adapter) / HDTV
Supports Dual Dual-link @ high resolution up to dual 2560x1600
Specifications
Header
Compatibility PC
Manufacturer Gigabyte Technology
Model NX86T512H
Product Line Gigabyte GV
Video Input
Type None
Video Memory
Bus Width 128-bit
Installed Size 512 MB
Memory Clock Speed 800 MHz
Technology DDR II SDRAM
Video Output
API Supported DirectX 10
OpenGL 2.0
Core Clock Speed 570 MHz
Digital Video Standard Digital Visual Interface (DVI)
Graphics Processor / Vendor NVIDIA GeForce 8600 GT
Graphics Processor Manufacturer NVIDIA
HDCP compatible Yes
Interface Type PCI Express x16
Max Monitors Supported 2
Max Resolution (external) 2560 x 1600
TV Interface HDTV out
Video Adapter Features GIGABYTE Silent-Pipe II
Nvidia SLI Multi-GPU Technology
Windows Vista
Readiness Windows Vista Ready
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2

External Hard Drive

I looked at two different external hard drives: the Buffalo DriveStation TurboUSB 250GB and the Iomega Professional Hard Drive eSATA/USB 500GB.

2.1 Possibilities

2.1.1 Buffalo DriveStation TurboUSB 250GB

Capacity

It can store up to 250GB, the minimum required capacity.

Data transfer rate

It has a maximum data transfer rate of 480Mb/s, by far exceeding the 50MB/s that is required.

Cost

It costs £68.51 — 27.4p per gigabyte.

2.1.2 Iomega Professional Hard Drive eSATA/USB 500GB

Capacity

It can store up to 500GB, double the minimum required capacity.

Data transfer rate

It has a maximum data transfer rate of 3Gb/s, even further exceeding the 50MB/s that is required.

Cost

It costs £99.90 — 20.0p per gigabyte.

2.2 Recommendation

I would recommend purchasing the *Iomega Professional Hard Drive eSATA/USB 500GB* because:

2.2.1 Capacity

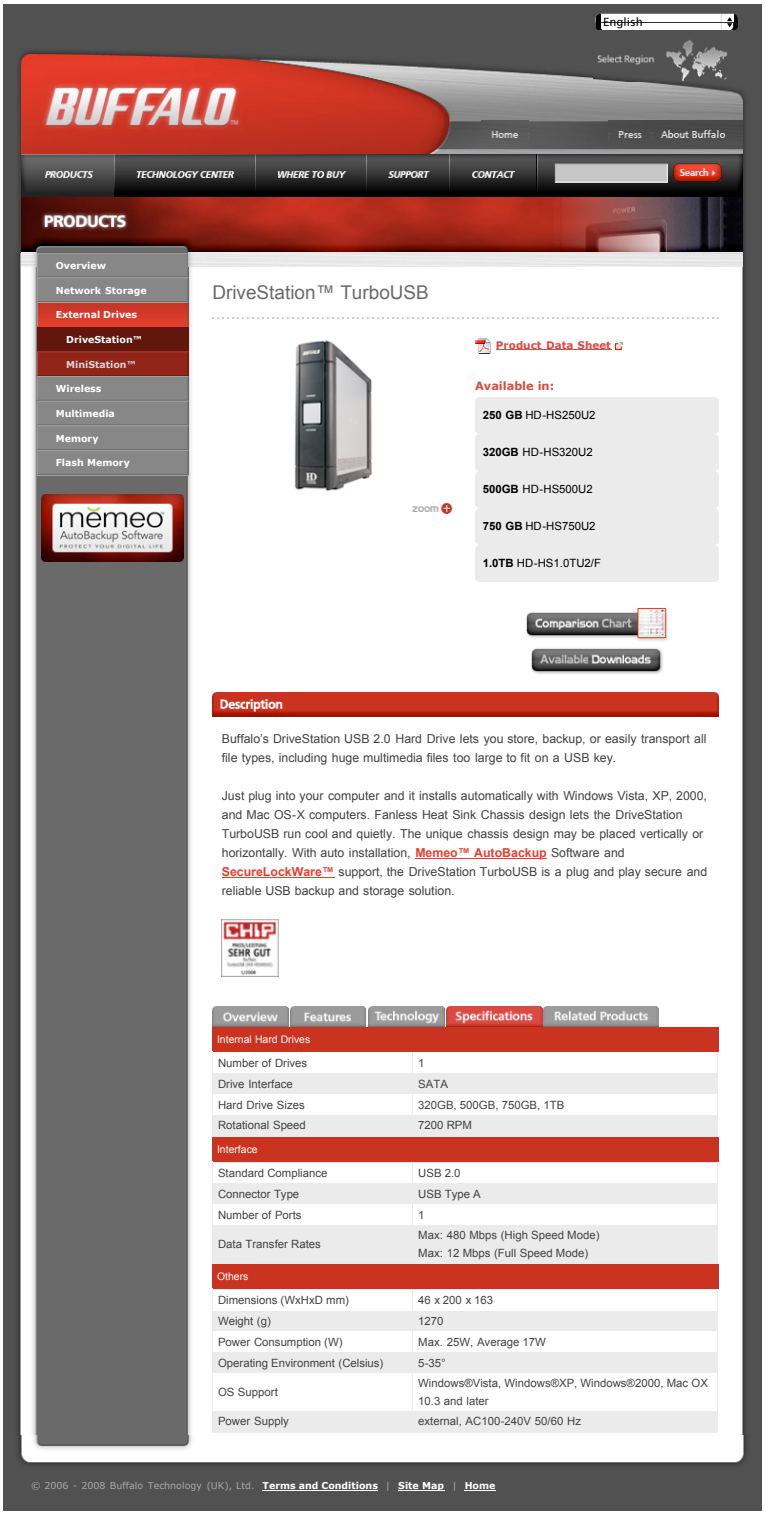
The Buffalo drive has the bare minimum required storage space, and as storage requirements grow over time it is useful to have more space, therefore the Iomega drive is more suitable.

2.2.2 Data transfer rate

The increased maximum data transfer rate is irrelevant as the figures specified are the theoretical maxima of the interfaces, both of which are far greater than the speed of the hard-drive (which will, however, be above 50MB/s).

2.2.3 Cost

The Iomega drive has a far lower cost per gigabyte — almost two-thirds cheaper.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Description
Buffalo's DriveStation USB 2.0 Hard Drive lets you store, backup, or easily transport all file types, including huge multimedia files too large to fit on a USB key.
Just plug into your computer and it installs automatically with Windows Vista, XP, 2000, and Mac OS-X computers. Fanless Heat Sink Chassis design lets the DriveStation TurboUSB run cool and quietly. The unique chassis design may be placed vertically or horizontally. With auto installation, Memeo™ AutoBackup Software and SecureLockWare™ support, the DriveStation TurboUSB is a plug and play secure and reliable USB backup and storage solution.
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Technology
Specifications
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Internal Hard Drives
Number of Drives 1
Drive Interface SATA
Hard Drive Sizes 320GB, 500GB, 750GB, 1TB
Rotational Speed 7200 RPM
Interface
Standard Compliance USB 2.0
Connector Type USB Type A
Number of Ports 1
Data Transfer Rates Max: 480 Mbps (High Speed Mode) Max: 12 Mbps (Full Speed Mode)
Others
Dimensions (WxHxD mm) 46 x 200 x 163
Weight (g) 1270
Power Consumption (W) Max. 25W, Average 17W
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Specifications

Dimensions & Weight	
Depth	16.3 cm
Height	20 cm
Weight	1.3 kg
Width	4.6 cm
Environmental Parameters	
Humidity Range Operating	20 - 80%
Max Operating Temperature	35 °C
Min Operating Temperature	5 °C
External Hard Drive	
Interface Speed	480 Mbps
Internal Drive Interface	Serial ATA
Power Source	Included AC adapter
Header	
Compatibility	Mac PC
Manufacturer	Buffalo Technology
Model	HD-HS250U2
Packaged Quantity	1
Product Line	Buffalo DriveStation TurboUSB
Miscellaneous	
Included Hard Drive Accessories	Fan
Power Device	
Frequency Required	50/60 Hz
Nominal Voltage	AC 120/230 V
Power Consumption Operational	25 Watt
Type	Power adapter
Service & Support	
Type	2 years warranty
Software	
Type	Drivers & Utilities Memeo AutoBackup SecureLockWare
Storage	
Total Storage Capacity	250 GB
Type	Hard drive
Storage Controller	
Controller Interface Type	Serial ATA-150
Interface Type	Hi-Speed USB
Type	Serial ATA
Storage Controller (2nd)	
Type	None
Storage Hard Drive	
Capacity	250 GB
Features	Secure Lock Ware
Form Factor	3.5"
Hard Drive Type	External hard drive
Interface Type	Hi-Speed USB
Spindle Speed	7200 rpm
System Requirements	
OS Required	Apple MacOS X Microsoft Windows 2000 / ME / XP/ Vista Microsoft Windows 98 Second Edition

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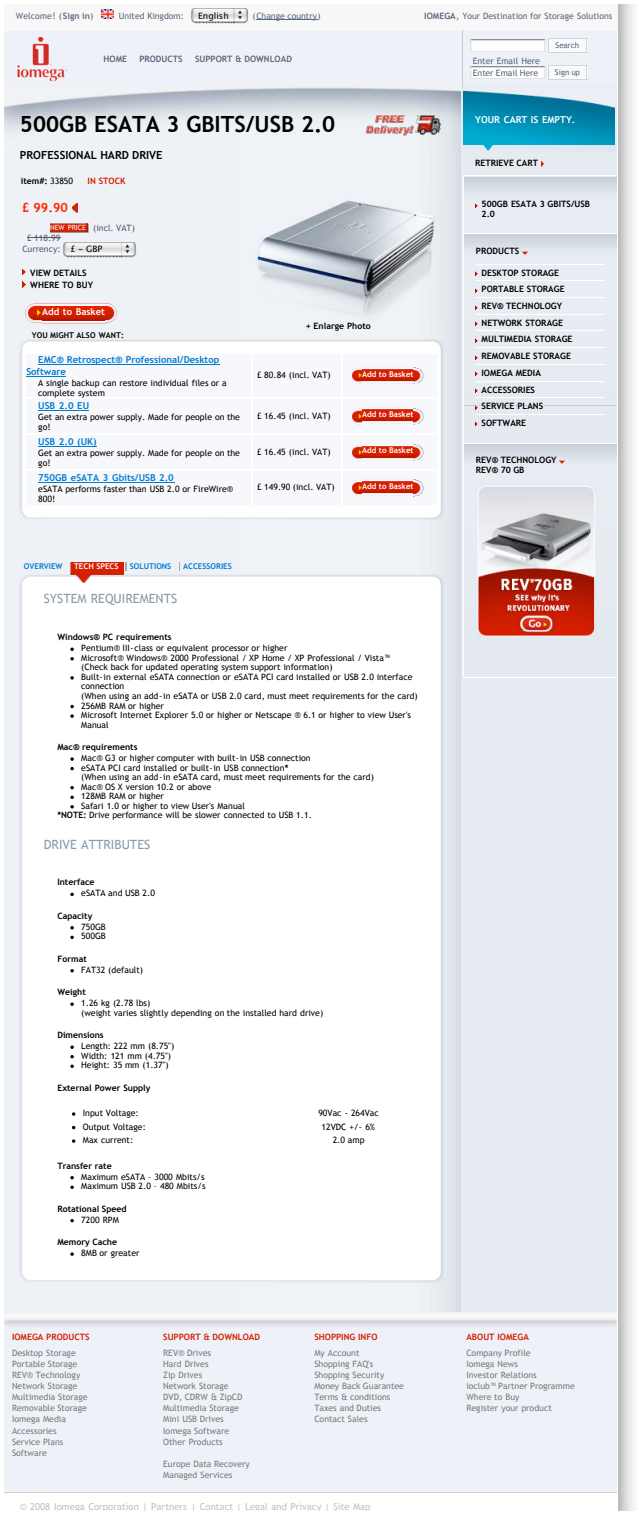

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3

Laptop

I looked at two different laptops: the Apple MacBook 2.1GHz and the Sony VAIO VGN-NR21Z/S.

3.1 Possibilities

3.1.1 Apple MacBook 2.1GHz

Processor

It uses a Core 2 Duo T8100: a "Penryn" based Core 2 Duo processor running at 2.1GHz, which is in excess of the required 1.6GHz.

Memory

As standard, it includes 1GB of RAM, and can take up to the required 4GB of RAM.

Cost

The MacBook costs £699.00 — placing it in the low–mid range of laptops.

3.1.2 Sony VAIO VGN-NR21Z/S

Processor

It uses a Core 2 Duo T8100: a "Penryn" based Core 2 Duo processor running at 2.1GHz, which is in excess of the required 1.6GHz.

Memory

As standard, it includes 3GB of RAM, and can take up to the required 4GB of RAM.

Cost

The VAIO costs £699.00 — placing it in the low–mid range of laptops.

3.2 Recommendation

I would recommend purchasing the *Sony VAIO VGN-NR21Z/S* because:

3.2.1 Processor

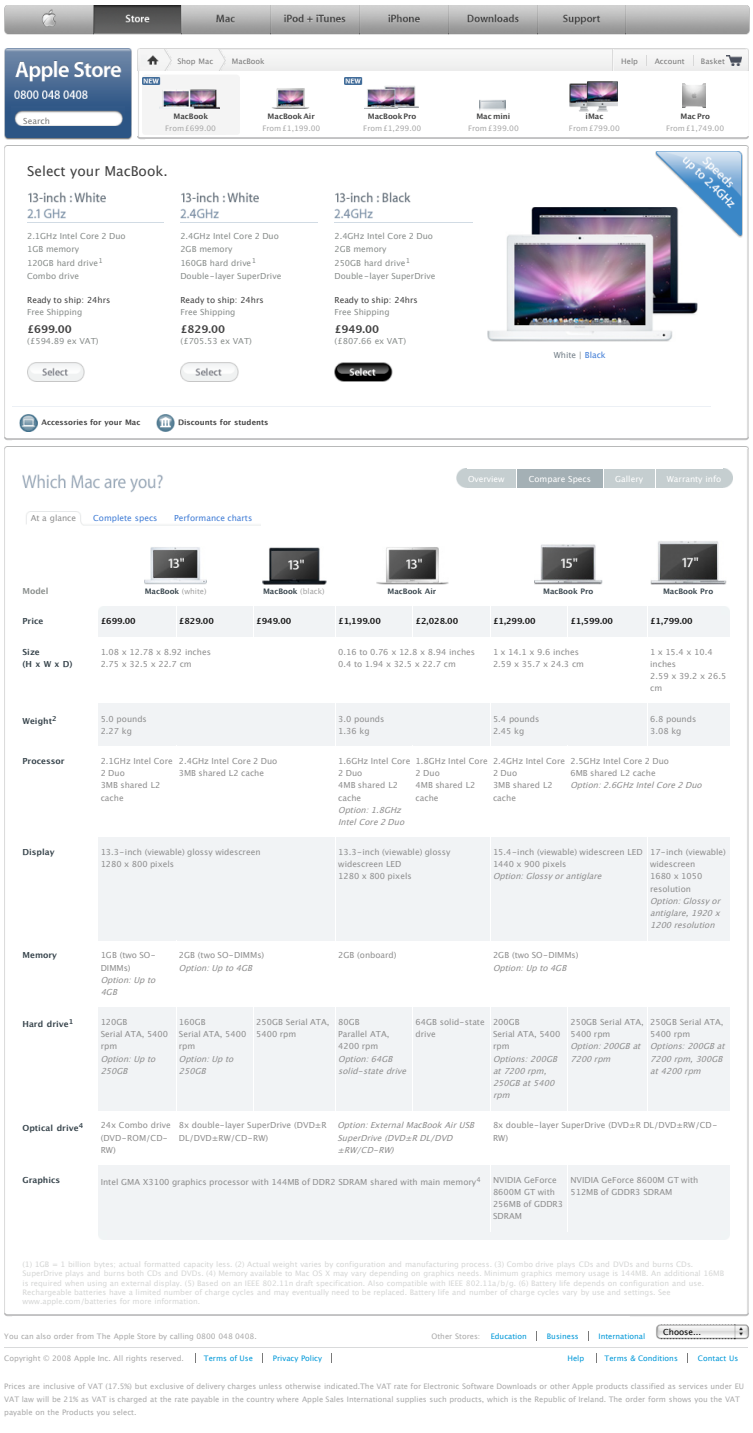
Both laptops have identical processors, both of which meet the requirements. Neither, therefore, is better than the other.

3.2.2 Memory

The VAIO includes 3GB RAM — 2GB more than the MacBook. However, both meet the requirement of being expandable to 4GB. The VAIO is better due to its greater standard amount.

3.2.3 Cost

Both cost £699.00, again there is no better option because of this.



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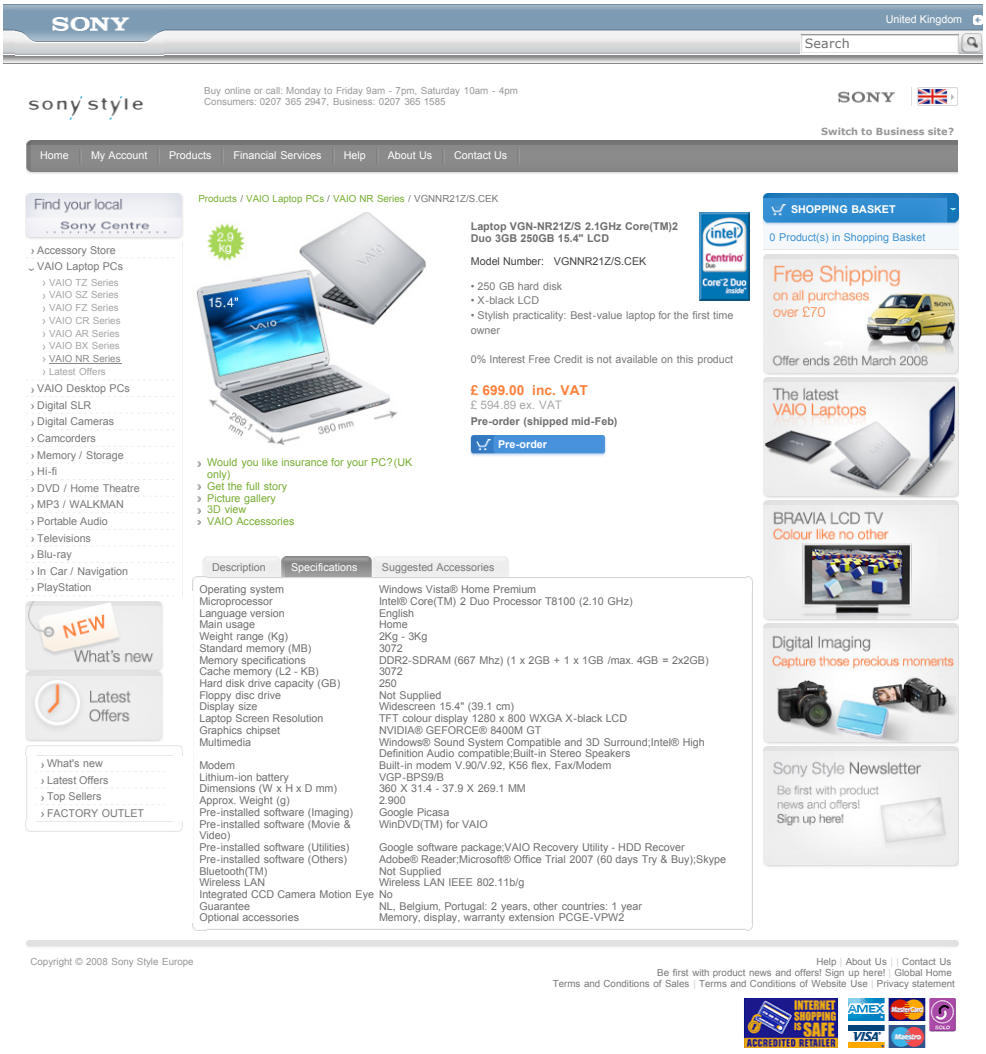
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2.9 kg
15.4"
269.1 mm
360 mm
Laptop VGN-NR21Z/S 2.1GHz Core(TM)2 Duo 3GB 250GB 15.4" LCD
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• 250 GB hard disk
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Description | Specifications | Suggested Accessories
Operating system: Windows Vista® Home Premium
Microprocessor: Intel® Core(TM) 2 Duo Processor T8100 (2.10 GHz)
Language version: English
Main usage: Home
Weight range (Kg): 2Kg - 3Kg
Standard memory (MB): 3072
Memory specifications: DDR2-SDRAM (667 Mhz) (1 x 2GB + 1 x 1GB /max. 4GB = 2x2GB)
Cache memory (L2 - KB): 3072
Hard disk drive capacity (GB): 250
Floppy disc drive: Not Supplied
Display size: Widescreen 15.4" (39.1 cm)
Laptop Screen Resolution: TFT colour display 1280 x 800 WXGA X-black LCD
Graphics chipset: NVIDIA® GEFORCE® 8400M GT
Multimedia: Windows® Sound System Compatible and 3D Surround;Intel® High Definition Audio compatible;Built-in Stereo Speakers
Modem: Built-in modem V.90/V.92, K56 flex, Fax/Modem
Lithium-ion battery: VGP-BPS9/B
Dimensions (W x H x D mm): 360 X 31.4 - 37.9 X 269.1 MM
Approx. Weight (g): 2.900
Pre-installed software (Imaging): Google Picasa
Pre-installed software (Movie & Video): WinDVD(TM) for VAIO
Pre-installed software (Utilities): Google software package;VAIO Recovery Utility - HDD Recover
Pre-installed software (Others): Adobe® Reader;Microsoft® Office Trial 2007 (60 days Try & Buy);Skype
Bluetooth(TM): Not Supplied
Wireless LAN: Wireless LAN IEEE 802.11b/g
Integrated CCD Camera Motion Eye: No
Guarantee: NL, Belgium, Portugal: 2 years, other countries: 1 year
Optional accessories: Memory, display, warranty extension PCGE-VPW2
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4

Wireless Router

I looked at two different routers: the Belkin F5D7230UK4 and the Netgear DG834G v.2.

4.1 Possibilities

4.1.1 Belkin F5D7230UK4

Bandwidth

Wired It supports up to 100Mb/s, the 100baseTX standard. This remains common among most low-end routers.

Wireless It supports up to 54Mb/s, the 802.11g standard. This is the fastest that is currently in widespread use.

Security

It supports WEP and WPA: the former is deprecated (as it is not sufficiently secure any more), and the latter is still is wide-spread use.

Cost

It costs £29.30 — at the very low end of routers.

4.1.2 Netgear DG834G v.2

Bandwidth

Wired It supports up to 100Mb/s, the 100baseTX standard. This remains common among most low-end routers.

Wireless It supports up to 54Mb/s, the 802.11g standard. This is the fastest that is currently in widespread use.

Security

It supports WEP, WPA, and WPA2: WPA2 has the advantage over WPA of being a full implementation of 802.11i, which provides better encryption algorithms than the WPA subset provides.

Cost

It costs £49.99 — at the low end of routers.

4.2 Recommendation

I would recommend purchasing the *Netgear DG834G v.2* because:

4.2.1 Bandwidth

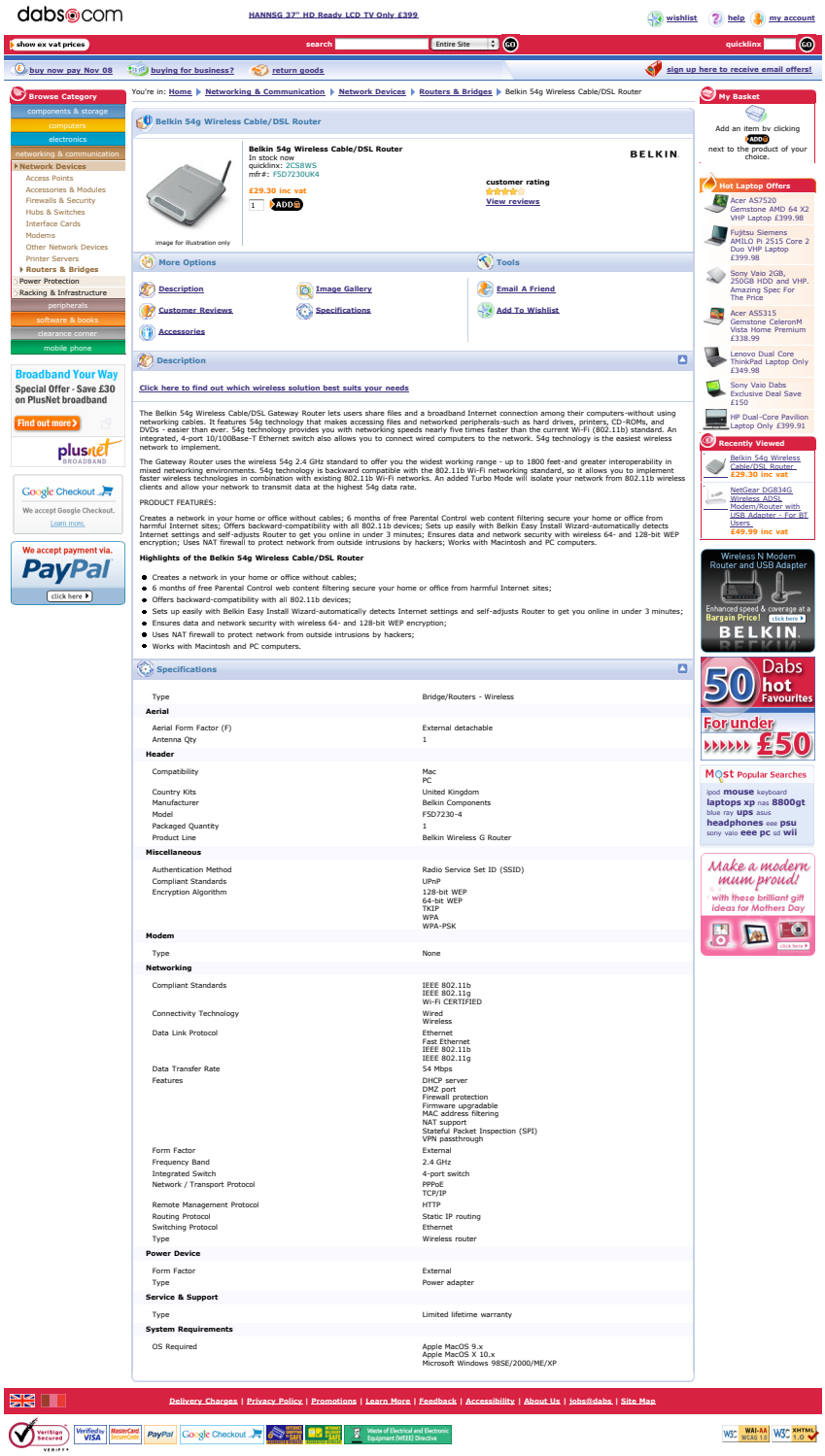
Both routers provide identical bandwidth.

4.2.2 Security

The Netgear router provides better security features, which in a public sitting is important, to help avoid data being accessed by those who shouldn't be able to do so.

4.2.3 Cost

Both have low prices, and the difference is small enough to be justifiable by greater functionality.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mfr#: F5D7230UK4
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1
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BELKIN
customer rating
View reviews
More Options
Description
Customer Reviews
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Click here to find out which wireless solution best suits your needs
The Belkin 54g Wireless Cable/DSL Gateway Router lets users share files and a broadband Internet connection among their computers-without using networking cables. It features 54g technology that makes accessing files and networked peripherals-such as hard drives, printers, CD-ROMs, and DVDs - easier than ever. 54g technology provides you with networking speeds nearly five times faster than the current Wi-Fi (802.11b) standard. An integrated, 4-port 10/100Base-T Ethernet switch also allows you to connect wired computers to the network. 54g technology is the easiest wireless network to implement.
The Gateway Router uses the wireless 54g 2.4 GHz standard to offer you the widest working range - up to 1800 feet-and greater interoperability in mixed networking environments. 54g technology is backward compatible with the 802.11b Wi-Fi networking standard, so it allows you to implement faster wireless technologies in combination with existing 802.11b Wi-Fi networks. An added Turbo Mode will isolate your network from 802.11b wireless clients and allow your network to transmit data at the highest 54g data rate.
PRODUCT FEATURES:
Creates a network in your home or office without cables; 6 months of free Parental Control web content filtering secure your home or office from harmful Internet sites; Offers backward-compatibility with all 802.11b devices; Sets up easily with Belkin Easy Install Wizard-automatically detects Internet settings and self-adjusts Router to get you online in under 3 minutes; Ensures data and network security with wireless 64- and 128-bit WEP encryption; Uses NAT firewall to protect network from outside intrusions by hackers; Works with Macintosh and PC computers.
Highlights of the Belkin 54g Wireless Cable/DSL Router
Creates a network in your home or office without cables;
6 months of free Parental Control web content filtering secure your home or office from harmful Internet sites;
Offers backward-compatibility with all 802.11b devices;
Sets up easily with Belkin Easy Install Wizard-automatically detects Internet settings and self-adjusts Router to get you online in under 3 minutes;
Ensures data and network security with wireless 64- and 128-bit WEP encryption;
Uses NAT firewall to protect network from outside intrusions by hackers;
Works with Macintosh and PC computers.
Specifications
Type: Bridge/Routers - Wireless
Aerial
Aerial Form Factor (F): External detachable
Antenna Qty: 1
Header
Compatibility: Mac, PC
Country Kits: United Kingdom
Manufacturer: Belkin Components
Model: F5D7230-4
Packaged Quantity: 1
Product Line: Belkin Wireless G Router
Miscellaneous
Authentication Method: Radio Service Set ID (SSID)
Compliant Standards: UPnP
Encryption Algorithm: 128-bit WEP, 64-bit WEP, TKIP, WPA, WPA-PSK
Modem
Type: None
Networking
Compliant Standards: IEEE 802.11b, IEEE 802.11g, Wi-Fi CERTIFIED
Connectivity Technology: Wired, Wireless
Data Link Protocol: Ethernet, Fast Ethernet, IEEE 802.11b, IEEE 802.11g
Data Transfer Rate: 54 Mbps
Features: DHCP server, DMZ port, Firewall protection, Firmware upgradable, MAC address filtering, NAT support, Stateful Packet Inspection (SPI), VPN passthrough
Form Factor: External
Frequency Band: 2.4 GHz
Integrated Switch: 4-port switch
Network / Transport Protocol: PPPoE, TCP/IP
Remote Management Protocol: HTTP
Routing Protocol: Static IP routing
Switching Protocol: Ethernet
Type: Wireless router
Power Device
Form Factor: External
Type: Power adapter
Service & Support
Type: Limited lifetime warranty
System Requirements
OS Required: Apple MacOS 9.x, Apple MacOS X 10.x, Microsoft Windows 98SE/2000/ME/XP
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Enhanced speed & coverage at a Bargain Price! click here
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customer rating
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More Options
Description
Customer Reviews
Specifications
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Email A Friend
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Description
This 802.11g wireless router adds considerable power and flexibility to your network. Five products in one, it combines an ADSL modem, router, 10/100 LAN switch, 802.11g access point, and SPI True Firewall. It gives you untethered continuous connectivity to your network resources and the Internet, and allows you to share your broadband access with all of your networked computers wireless or with wires using Ethernet cables. Featuring high-speed 802.11g wireless capability - up to five times faster than 802.11b - it allows you to download large files, videoconference, and distribute and play high-quality digital movies, photos, and MP3s in the blink of an eye. Simple to use, it plugs directly into your ADSL line. An integrated switch lets you directly connect four computers or any combination of four computers, access points or printers. Setup couldn't be easier - NETGEAR's Smart Wizard install assistant and on-screen help guide you through each step. The Smart Wizard automatically detects and makes the best connection to your ISP. True Firewall protects your network with business-class security against intruders, including logs and alerts of break-in attempts, while VPN pass-through makes it safe to connect to your business network from home or office. The contemporary, sleek design of this unit suits your home or office. Future upgrades to firmware can be obtained via the Internet.
The DG834G gives you instant connectivity with or without wires, and works with your existing 802.11b devices as well as your new 54 Mbps 802.11g devices. A built-in ADSL modem furnishes direct, always-on Internet connectivity and multi-user access sharing at speeds up to 140 times faster than dial-up. This powerful router distributes MP3s, digital movies and photos with ultra-fast 10/100 switched LAN ports capable of speeds of 200 Mbps, and shares a single IP address with up to 253 users. And, it boasts double the memory and a 50% faster CPU than many popular routers.
No need for a separate modem - this connects directly into your ADSL line. Built-in Port Forwarding settings, Universal Plug and Play (UPnP) and Virtual Private Network (VPN) pass-through make it simple to play Internet games, send instant messages, and host Internet services. User interface matches your local language (English, French, German or Italian). It supports PCs, Macintosh, and virtually all Ethernet devices, and comes with an Ethernet cable for connecting your first computer.
True Firewall using Stateful Packet Inspection (SPI) and Intrusion Control features Denial of Service protection from hacker attacks, while VPN (Virtual Private Network) pass-through permits secure access to your office or corporate network and enables you to host VPN services. Content filtering lets you control access to inappropriate web sites and limit usage by time of day. Logs browsing activities and provides optional e-mail alerts so you can monitor access. DMZ support allows unrestricted access from the Internet to one computer (for hosting web services).
Dimensions & Weight / Depth 16.9 cm
Dimensions & Weight / Height 3.4 cm
Dimensions & Weight / Weight 0.6 kg
Dimensions & Weight / Width 25.5 cm
Header / Compatibility PC
Header / Compatibility Mac
Header / Compatibility Unix
Header / Country Kits United Kingdom
Header / Localization English
Header / Manufacturer NetGear
Header / Model DG834G 54 Mbps Wireless ADSL Firewall
Header / Packaged Quantity 1
Header / Product Line NETGEAR
Modem / Digital Signaling Protocol ADSL
Modem / Protocols & Specifications ITU G.992.2 (G.Lite)
Modem / Protocols & Specifications ITU G.992.1 (G.DMT)
Networking / Connectivity Technology Wireless
Networking / Data Link Protocol Fast Ethernet
Networking / Data Link Protocol IEEE 802.11b
Networking / Data Link Protocol IEEE 802.11g
Networking / Data Link Protocol Ethernet
Networking / Form Factor External
Networking / Network / Transport Protocol TCP/IP
Networking / Network / Transport Protocol IPSec
Networking / Network / Transport Protocol PPPoA
Networking / Network / Transport Protocol L2TP
Networking / Network / Transport Protocol UDP/IP
Networking / Network / Transport Protocol PPPoE
Networking / Network / Transport Protocol PPTP
Networking / Routing Protocol Static IP routing
Networking / Routing Protocol RIP
Networking / Switching Protocol Ethernet
Networking / Type Wireless router
System Requirements / OS Required Linux
System Requirements / OS Required Apple MacOS
System Requirements / OS Required Novell NetWare
System Requirements / OS Required UNIX
System Requirements / OS Required Microsoft Windows 98/ME/NT/2000/XP
Device Type Wireless router
Form Factor External
Built-in Devices Antenna
Width 25.5 cm
Depth 16.9 cm
Height 3.4 cm
Weight 0.6 kg
Localisation English / United Kingdom
Connectivity Technology Wireless
Frequency Band 2.4 GHz
Line Coding Format DBPSK, DQPSK, CCK, 64 QAM, BPSK, QPSK, 16 QAM, OFDM
Framing Format ANSI T1.413
Data Link Protocol Ethernet, Fast Ethernet, IEEE 802.11b, IEEE 802.11g
Spread Spectrum Method OFDM
Switching Protocol Ethernet
Network / Transport Protocol TCP/IP, PPTP, UDP/IP, L2TP, IPSec, PPPoE, PPPoA
Routing Protocol RIP, static IP routing
Features Firewall protection, DMZ port, auto-sensing per device, DHCP support, NAT support, VPN, auto-uplink
Compliant Standards IEEE 802.11b, IEEE 802.11g
Type DSL modem
Digital Signaling Protocol ADSL
Protocols & Specifications ITU G.992.1 (G.DMT), ITU G.992.2 (G.Lite)
Interfaces 4 x network - Ethernet 10Base-T/100Base-TX - RJ-45 ¦ Modem - ADSL - RJ-11 (WAN) ¦ 1 x network - Radio-Ethernet
Cables Included 1 x network cable ¦ 1 x phone cable
Compliant Standards Plug and Play
Power Device Power adapter - external
Software Included Drivers & Utilities
OS Required UNIX, Apple MacOS, Novell NetWare, Linux, Microsoft Windows 98/ME/NT/2000/XP
Min Operating Temperature 0 °C
Max Operating Temperature 40 °C
Humidity Range Operating 0 - 90%
With USB Adapter:
NETGEAR's 54 Mbps Wireless USB 2.0 Adapter enables 54 Mbps wireless Internet access to either your desktop or notebook PC. New antenna technology delivers greater range so you can move extended distances without losing your connection. Setup is now made quick and easy with a new Smart Wizard install assistant. High-level WEP encryption shields your network from wireless eavesdroppers without sacrificing performance.
Specifications
Networking
Compliant Standards
IEEE 802.11b
IEEE 802.11g
Connectivity Technology
Wireless
Data Link Protocol
Ethernet
Fast Ethernet
Data Transfer Rate
54 Mbps
Form Factor
External
Type
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Lenovo Dual Core ThinkPad Laptop Only £349.98
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XHTML 1.0

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5

Report Of Expenditure

Product	Cost
Graphics Card	£68.86
External Hard Drive	£99.90
Laptop	£699.00
Wireless Router	£49.99
Total	£917.75

The total falls well within the £1200 budget, without compromising on what is being purchased.